ENGINEERING NEWS-RECORD

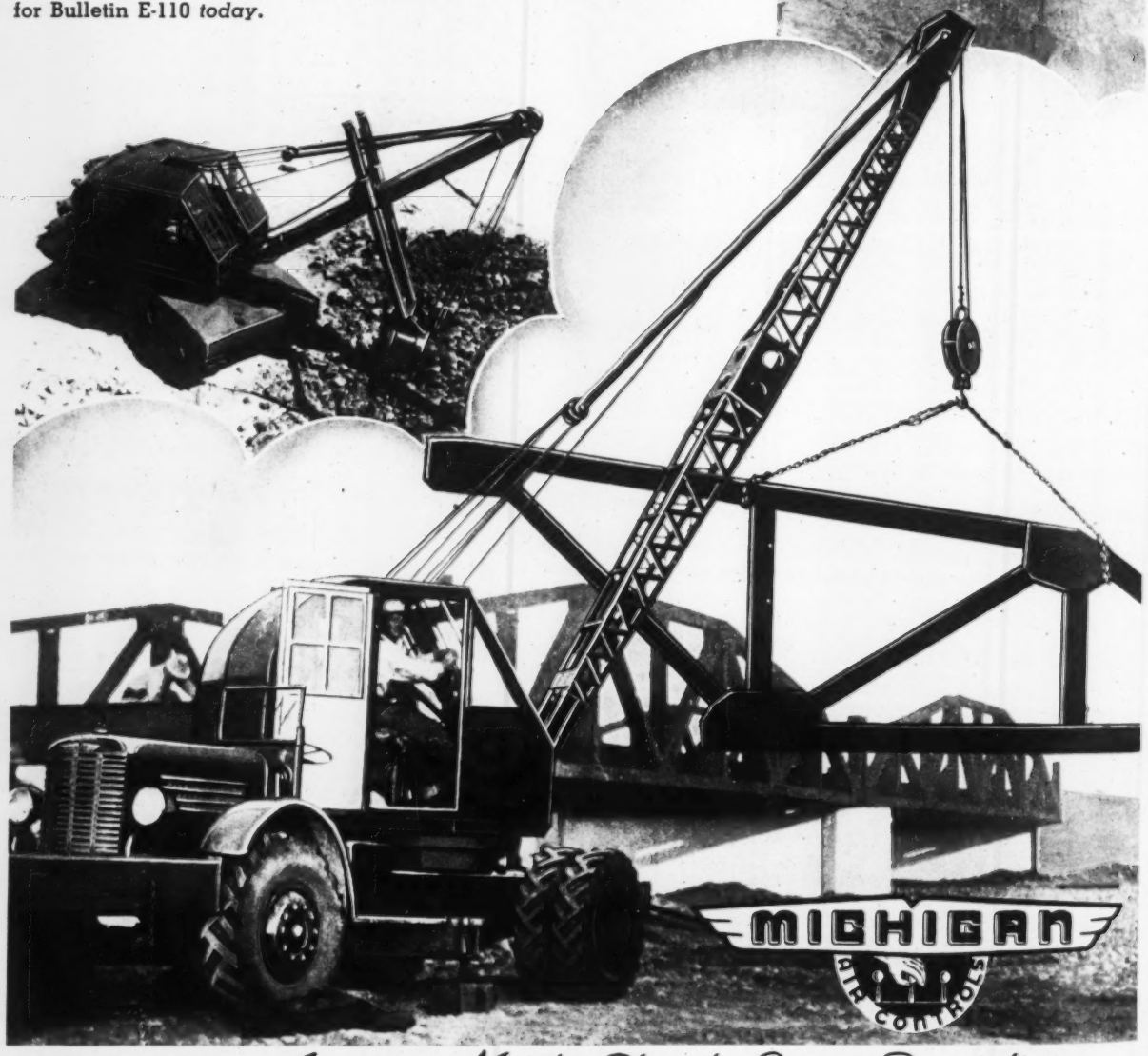
Constructing inner limestone dome for Jefferson Memorial at Washington—*See page 2*

DEC 2 1940

UNIV OF MICHIGAN
GENERAL LIBRARY
ANN ARBOR MICH

There's PROFIT in that Small Job, Too!

Make *small* jobs, as well as larger ones, pay dividends. Reduce non-productive travel time between locations with the mobile MICHIGAN'S 25 mph. road speed. Let enthusiastic operators show you how MICHIGAN'S Air Controls increase productive time *on the job!* Here's fast-pace production without let-downs due to operator fatigue. Let the convertible MICHIGAN write a new story of economy and dependability into your cost records. Every MICHIGAN is built from the ground up for hard, tough going. You can handle Shovel, Crane, Clam, Dragline or Trench Hoe work with the same machine—and at a profit! Join the many MICHIGAN owners who are saying "NOW, there's PROFIT in my *small* jobs, too!" Write for Bulletin E-110 *today*.



MICHIGAN *America's Mobile Shovel-Crane Specialists*

MICHIGAN POWER SHOVEL CO.

BENTON HARBOR MICHIGAN

The Week In Engineering and Construction

ENGINEERING NEWS-RECORD • NOVEMBER 28, 1940

Heavy damage in Texas follows four days of rain

Numerous highway bridges destroyed, at least two dams fail, and traffic interrupted on several railroads

East Texas lowlands from the Louisiana state line to below Austin were flooded Sunday and Monday as the Guadalupe, Colorado, Brazos, Trinity, and Sabine rivers overflowed their banks following four days of torrential rains. The peak had been passed Tuesday.

In the flood area 23 major state and federal highways have been closed because of washouts and damaged bridges. Commissioners of Anderson County at Palestine estimate nearly 100 bridges and culverts were washed out. Two steel highway bridges were washed away at Columbus on the Colorado River of Texas, where the city was an island in the river for 24 hours without water, light or gas. Two more highway bridges were washed out at Cuero on the Guadalupe River, where 80 city blocks were under water Saturday night with power in the city interrupted until Sunday night.

Damage to railroads

Tracks of the Southern Pacific R.R. were washed out between Weimer and Schulenberg and a landslide covered tracks between Columbus and Alleyton. Santa Fe Lines lost a bridge at Martins Creek three miles north of the city of Beckville. The Houston & Texas Central R.R. had tracks washed out at Waller and tracks of the Illinois & Great Northern R.R. were washed out near Palestine.

Freezing in the northwest

Meanwhile in northwest Texas the city of Amarillo underwent a quick freeze. Ice coated and brought down power and communication lines and caused a shortage in the city water supply. Telegraph communication with Amarillo Tuesday morning had been out since 2 p.m. Sunday. Telephone lines are also down in 16 northwest counties. The Angelina River flooded Lufkin and Nacogdoches, depriving both cities of light and power for 24 hours starting Sunday. The Houston Lighting & Power Co., routed auxiliary power lines to Brenham and Bellville in the Brazos River valley.

Two dams fail

A gap 250 ft. wide was opened in Martin Davey Lake Dam five miles northeast of Palestine. Near Carthage, Lake Dixie Dam has a 40 ft. breach. Within 12 hours on Sunday the level of the lake above Buchanan Dam on the Colorado River of Texas rose 1.72 ft., although the upper watershed had considerably less rainfall than the lower watershed.

Rainfall records

Three-day rainfall records at various cities follow: Columbus, 11 in.; Schulenberg, 14 in.; Conroe, 21 in.; Center, 11.66 in.; Palestine, 13.45 in.; Waller, 15 in.; Carthage, 14 in., and Hempstead, 16 inches.

The Trinity River reached 38 ft. above normal at Long Lake. The Colorado River was 37 ft. above normal at Columbus. The Sabine was 37 ft. at Carthage and 26 ft. at Pendleton. The Gaudalupe was 2 miles wide at Hochheim and 25½ ft. above normal at Cuero, while the Brazos was up 32 ft. at Chapel. Indications Tuesday were that floods may be experienced in cities near the Gulf of Mexico, but the worst was over. Rain ceased Monday afternoon.

Carl S. Ell new head of Northeastern University

Carl E. Ell (right), dean of the college of engineering at Northeastern University since 1917 and vice president of that school since 1925, was inaugurated as the university's president at Boston on Nov. 19. He succeeds Frank Palmer Speare. He is shown talking with President H. N. Davis of Stevens "Tech" about the importance of training engineers and their subordinates for the industrial side of the defense program.

President Ell is a graduate of De Pauw University and Massachusetts Institute of Technology. Starting in 1911 he worked for a time as inspecting engineer for the New York state department of health in connection with water supplies and summer resorts. He soon became assistant engineer to Earle B. Phelps, consulting engineer on water purification and sewage disposal plants. From 1912 to 1917 he was head of the civil engineering department and assistant dean of engineering at Northeastern. In 1917 he acted as deputy commissioner of the New York state department of health in connection with the enforcement of the sanitary code and narcotic law.

Chicago subway extension provided by grant

A federal grant of $5,130,000 to the city of Chicago, announced Nov. 19 by Jesse H. Jones, federal loan administrator, provides for an extension of the Dearborn St. subway that will make operation of this transit link possible. The grant has been approved by John M. Carmody, federal works administrator. The Dearborn St. twin tubes, upon which construction is nearing completion, now enter the loop from the northwest at Lake and Dearborn streets, running south to Van Buren St. In the current project no provision is made for turning the trains, so the link would be inoperative. The new grant, to which the city will add $870,000 to bring the total to $6,000,000, will permit the Dearborn St. link to be extended south a block to Congress St., then west for four blocks to the south branch of the Chicago River, where an underground turning loop will be built. This link is entirely separate from the State St. route, also nearing completion, which will take care of north and south traffic.

While the Dearborn St. route has been shield-driven within the Loop, it has not yet been decided how the extension will be built, whether by hand-mining or by shield. Since an ordinance must be passed by the city council authorizing the extension, it is not known at present just when construction can be started. Construction plans also include a station in Congress St. between Clark and Wells streets, and stubs for extending the Congress St. route westward under the river.

Next on the Chicago subway schedule will be extension of the Congress St. route westward to connect with the west side elevated at Racine Ave., and a branch of the Dearborn St. route running west under Lake St. to connect with the Lake St. elevated at Racine Ave. Completion of these two extensions will permit demolition of the elevated structure in Wabash and Lake streets in the Loop.

Financing of these extensions is not yet in sight. Meanwhile the $5,000,000 federal loan offered the city for modernization and unification of all transit facilities, including new rolling stock to permit operation of the subway sections now nearing completion, has been jeopardized by sudden withdrawal of the Chicago Motor Coach Co. offer to sell out to the city for $10,000,000. The bus company now suggests universal transfers, but such a plan is frowned upon by federal officials, who offered the loan on condition of a unified transit system.

Fairchild Aerial Surveys photo

Jefferson Memorial takes shape in Washington

Scheduled for completion in June 1941 and now about 90 percent complete, the $3,000,000 Jefferson Memorial in Washington, D. C. is beginning to assume its final shape. The memorial is circular in form, and has a central hall sheltering a statue of Thomas Jefferson and an outer colonnade 150 ft. in diameter. The central hall is topped by two concentric domes. Construction was started in December of 1938.

In the photo on the cover of this issue, workmen are placing stone for an inner dome — a self supporting limestone structure varying in thickness from 2 ft. at the base to 8 in. at the top. It is supported during construction by wooden centering rising from the floor of the memorial. At the base of the dome can be seen the beginning of the riveted steel frame which will form the major reinforcing for an outer dome of reinforced concrete. This will be poured with wooden forms to make a 4-in. slab and will be faced with marble.

The dome rests on a double ring wall of plain brick masonry faced with marble. The circular parapet in the foreground rests on an outer ring of marble columns. The circular wall and the ring of columns are each founded on a ring of 24-in. steel caissons 12 ft. on centers. Caissons are driven to rock at an average depth of about 95 ft. and an extreme depth of 150 ft.

The contractor, John McShain, Philadelphia, has obtained unusually efficient erection by using the four stiffleg derricks on towers shown in the above photo.

Eggers & Higgins, New York, are architects for the project. Elwyn E. Seelye is structural engineer for the job and consultant for the foundations, and John Monks & Sons, engineers for the foundation. In charge for the government is F. F. Gillen, acting superintendent of National Capital Parks.

• • •

Indiana road head tells of superhighway plan

M. R. Keefe, chief engineer of the Indiana State Highway Commission, on Nov. 18, in speaking before the closing session of the 61st annual Indiana All-Engineers' meeting at Indianapolis, told of the possibility of a superhighway being built across his state. The road would be part of a tri-state superhighway crossing Ohio, Indiana and Illinois to connect to the Chicago area on the west and the Pennsylvania Turnpike on the east.

The probable location of the highway would be between U. S. Highways Nos. 6 and 30. Keefe pointed out that the state highway commission had already drawn up plans for such a road from the Illinois state line east to U. S. Highway No. 41 to alleviate the traffic problem through the Chicago region and the Calumet industrial area.

No tolls would be charged for Indiana's portion of the road, according to Keefe.

Engineering News-Record is published every Thursday by McGraw-Hill Publishing Company, Inc., at 99-129 North Broadway, Albany, N. Y. Editorial and business offices 330 West 42nd St., New York, N. Y. Subscription, domestic, Canada, Mexico, Central and South American countries $5 for one year, $8 for two years, $10 for three years. Great Britain and British Possessions 54 shillings for one year, 108 shillings for three years. All other countries $9 for one year, $18 for three years. Entered as second class matter October 29, 1936, at the Post Office at Albany, N. Y., under the act of March 3, 1879. Printed in U. S. A. Cable address "McGrawhill New York." Member A.B.P. Member A.B.C. Copyright 1940 by McGraw-Hill Publishing Co., Inc. James H. McGraw, Founder and Honorary Chairman; James H. McGraw, Jr., President; Howard Ehrlich, Executive Vice-President; Mason Britton, Vice-Chairman; B. R. Putnam, Treasurer; D. C. McGraw, Secretary; J. E. Blackburn, Jr., Circulation Manager.

McLaughlin Air Service photo

Pittsburgh housing project provides 2,653 dwellings

Terrace Village housing project in Pittsburgh, covering 150 acres on three hills with seven terraces of construction, is rapidly nearing completion. The project is divided by a 12-acre playground and park into Terrace Village No. 1 with 802 dwellings and Terrace Village No. 2 with 1851 dwellings. For the work 3,500,000 cu. yd. of earth were moved. The project has one central heating plant and receives water from the city of Pittsburgh system. The total cost of the undertaking is $14,750,000.

September 1941 has been set as the date for completion of the entire work, grading for which began March 17, 1939. Some of the units are already completed.

The work is a project of the housing authority of the city of Pittsburgh. Marlier, Lee, Boyd and Prack, with Henry Schwerin as job representative, are the architects. Ernest Heckler is engineer for the authority.

The earth work was done by the Harrison Construction Co., Pittsburgh, and Hinman Bros., Denver, Colo. Construction is being done by Smith & Co., Chicago, and Hunkin-Conkey Co., Cleveland, Ohio, on the first and second villages, respectively.

Chicago district gets temporary diversion

On order of the U. S. Supreme Court, Nov. 25, the Sanitary District of Chicago has been given a 10-day authorization beginning Dec. 2 to increase its diversion from Lake Michigan from the present 1,500 cfs to 10,000 cfs for test purposes. The test is to determine to what extent the sludge banks in Brandon Road pool can be flushed out. Decomposing sludge in the pool, which extends upstream through Joliet, started the present hearing before a master of the U. S. Supreme Court. The state of Illinois on complaint of Joliet citizens applied to the court for permission to increase the diversion to 5,000 cfs until the district could complete additional sewage treatment facilities (see *ENR* Nov. 21, p. 698). The master suggested the increased temporary diversion as an experiment.

The increased diversion will bring back the flow rates essentially to those in effect in 1929. It will be distributed as follows among the three points of diversion: The gates in the Sag Channel will be opened wide to pass 2,500-cfs and thus produce a flow rate of 2½ fps. The lock gates at the mouth of the Chicago River will also be left open except for lockage purposes, thus permitting a flow of about 1¼ fps in the river where it passes through the center of the city. The three pumps at Wilmette will be operated, which will give about 1,200 cfs flow in the North Shore Channel. Downstream from the entrance of the North Branch the flow will be about 2½ fps. These velocities take into account the flow of domestic sewage which is in addition to the diversion water.

A certain amount of flushing of the river, Main and Sag channels will take place. Chemical tests will be carried out to determine the effectiveness of the flushing experiment.

Increased diversion was opposed before the Supreme Court by some of the Lake states. They suggested dredging, oxidation of the sludge by passing it over the Lockport Dam, or chlorination of the sludge. These proposals were held to be impracticable or too costly, according to the engineers of the Chicago Sanitary District.

Merritt Parkway cost $540,000 per mile

The Connecticut State Highway Department in its semi-final report on the cost of the Merritt Parkway from the Connecticut-New York state line at Greenwich to the Housatonic River, made known that the total expenditures up to Aug. 31 of this year were in excess of $540,000 a mile for the toll parkway. The total cost, exclusive of interest on the bond issue, is $20,592,001. Actual construction of the parkway cost $11,090,000. This was the largest single expenditure. Land acquisitions for the right-of-way cost $6,907,000; expenditures for landscaping and roadside beautification added $1,579,600; and engineering expenses were $856,400.

Toll collections reveal that there is 40 to 50 per cent less traffic at the Milford toll station near the Housatonic River crossing as compared to the Greenwich station. From Sept. 2 to Nov. 9 of this year the Greenwich station collected 1,425,133 tolls while the Milford station collected only 850,765 tolls. Toll collections for the year were to $493,440.

Survey shows Congress passed many bills of engineering interest

Most important work was setting up machinery for armament program but many non-defense measures passed

Congress is still in session, but by present appearances the bulk of its work is done and for the rest of the year it will be in session largely as a precautionary measure. It has been a Congress which, as far as the normal business of the government is concerned accomplished little, but which under the stimulus of war abroad, passed a great body of defense legislation setting up the legal machinery for the armament program.

Among the few major non-defense measures passed were the Omnibus Transportation Act, bringing water carriers under the Interstate Commerce Commission; the long-pending revision of the rate structure at Boulder Dam; and changes in the highway act to give weight to war department recommendations on road locations. The Congress turned down a proposal for long term loans for highway rights-of-way. It refused additional funds to continue the peacetime public housing. It held peacetime public works to the half-billion dollar level that the administration considers normal.

On the defense side, the legal change which most affected construction was the authorization of negotiated contracts, which have now almost superseded competitive bidding on defense work. Beyond this, the chief effect on construction has been to create a whole range of new categories of federal works—munitions plants, shipyards, barracks, military and naval bases.

Below is listed the legislation of engineering interest.

Water use and control

Revising the method of determining electric power rates at Boulder Dam.

Making the Bonneville Administration part of the Interior Department and authorizing appointment of an assistant administrator, chief engineer and general counsel.

Clarifying procedures for Bureau of Reclamation Great Plains projects and limiting the work that can be done by Department of Agriculture.

Increasing to ten the number of consultants that may be employed on a per diem basis on reclamation projects.

Authorizing the Corps of Engineers to accept loans from municipalities to start local flood protection projects.

Giving the consent of Congress to the Ohio River interstate pollution control compact.

Granting the consent of Congress to the Potomac River interstate pollution compact.

Water transportation

Making inland water carriers subject to regulation by the Interstate Commerce Commission.

Requiring the United States to bear the major part of the cost of altering bridges in the interest of navigation.

Authorizing certain river and harbor projects important to the national defense.

Highway bills

Requiring states to comply with defense road priorities as a condition for obtaining federal aid.

Authorizing RFC loans to states for acquisition of rights-of-way.

Extending the life of the Alaskan International Highway Commission for four years.

Miscellaneous

Making the Municipal Bankruptcy Act apply to counties and extending it to June, 1942.

Local contribution to WPA projects waived on certain defense projects.

Requiring payment of prevailing wage on public works in Alaska and Hawaii.

Defense legislation passed by Congress that has a bearing on the work of contractors and engineers is listed below.

Laws affecting industry

Limiting the profits of corporations.

Permitting negotiated contracts for military construction and supplies and for construction and operation of munitions plants.

Limiting the fee on cost-plus-a-fee contracts to 7 per cent of the estimated cost.

Permitting 30 per cent advances to defense contractors.

Authorizing the President, when it is in the public interest, to exempt defense contractors from the Walsh-Healey act.

Authorizing the President to embargo export of machinery, material, or supplies needed for defense.

Restrictive employment of aliens on confidential government contracts.

Empowering RFC to make loans to persons developing mineral resources of strategic value.

Laws relating to public works

Limiting the fee on Naval cost-plus-a-fee construction to 6 per cent.

Authorizing the Federal Works Administrator to carry out a $150,000,000 program of housing for defense workers and married enlisted men.

Authorizing the U. S. Housing Authority to build defense housing not subject to limitations on its regular projects.

Authorizing the Navy to build drydocks in New York harbor and in the Caribbean and to improve the Boston dock.

Permitting the cost of naval projects to be increased and existing contracts to be changed in order to expedite completion.

Authorizing federal construction of shipbuilding facilities.

Laws concerning armed forces

Permitting War Department laborers and mechanics to work more than 40 hours if time and a half is paid.

Permitting Navy employees to work more than 40 hours but requiring time and a half for professional and sub-professional men and employees not on an annual salary basis.

Permitting employment outside the civil service of engineers on defense projects.

Priorities system may soon affect construction

Possibility that the priorities system may soon have an effect on construction is seen in the Defense Commission. The possibility arises from the existence of a certain tightness in the supply of structural steel shapes. When the supply of an important commodity becomes less than the demand, someone has to decide who gets it, and that someone is the Priorities Board at Washington.

There is no thought at present that construction contracts be given the benefit of a priority rating. Where construction can be affected, however, is in the fact that if a manufacturer, say, of airplanes needs any one of a list of important and more or less scarce supplies, he can attach to his orders for those supplies the same preference rating that applies to his government contract for airplanes.

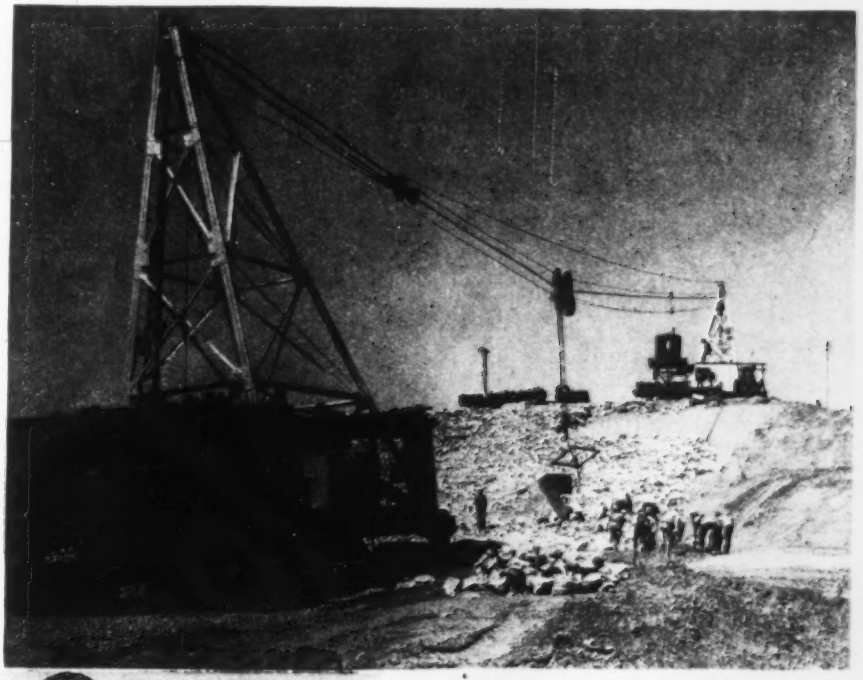
The supply of heavy steel plates and structural shapes is now being watched by the Priorities Board; if supply difficulties should become serious, they might be included on the priority list. This would mean that a non-defense builder might find his orders for shapes put behind the orders of an airplane or tank manufacturer who is building a new factory.

Although lumber supply is causing more trouble at present than steel, there is little possibility of priorities here. The demand arises almost entirely from the rush construction of cantonments, and though this has caused local and temporary shortages, the commission feels that the demand is well within the capacity of the industry.

WASHINGTON HIGHLIGHTS

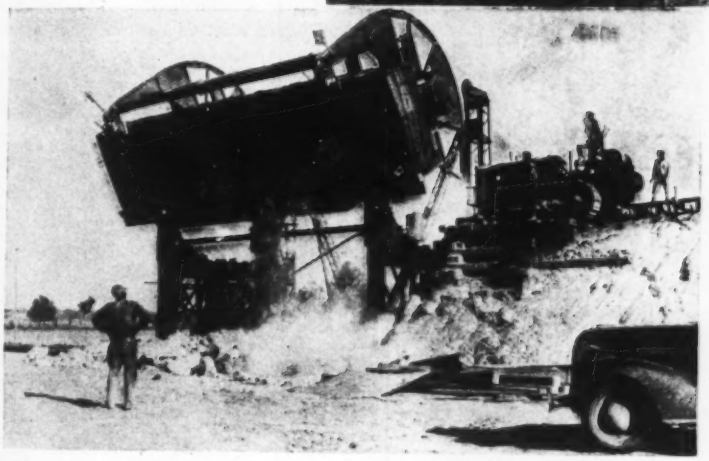
THE REPORT on defense highways in preparation by the Public Roads Administration has again been deferred, perhaps until the beginning of the year. At present, almost exclusive attention is being given to the problem of access roads to cantonments, and munitions plants. A series of conferences are now under way between PRA officials, state highway departments, and War Department officials to determine what funds can be made available without congressional action. The allotments of federal-aid money to be made next month, together with money now allocated but not yet obligated, amount to about $198,000,000 of primary road money, $38,000,000 of secondary road money, and $68,000,000 of grade crossing money. All but the last must be matched by the states.

Placing 175,000 cu. yd. of riprap for upstream face of Sardis Dam



U. S. Engineers photo

Using the cableway system at the right, little hand labor was required in placing the upstream slope riprap for Sardis Dam in a 3-ft. layer. Further reduction in hand labor was obtained through the use of the electric car-dumper shown below, a device developed for use at coal-handling plants.



FACED with the problem of placing 175,000 cu. yd. of riprap in a 3-ft. layer on the upstream face of Sardis Dam on the Tallahatchie River in Mississippi, Forcum-James Co., Dyersburg, Tenn., and H. N. Rodgers & Sons Co., Memphis, Tenn., made use of the cableway system and equipment illustrated on this page.

Riprap placing was begun in May 1939, and except for about two months lost due to bad weather, operation was continuous with two 8-hour shifts until the dam was completed in August this year. (*ENR*, Aug. 22, 1940, p. 257)

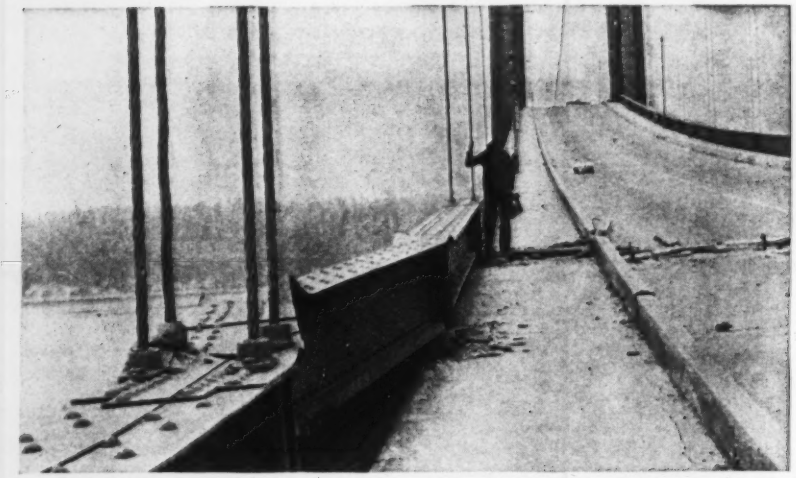
The stone, furnished under a supply contract by the United States, was delivered ten miles from the dam in 50-ton gondola cars on a spur of the Illinois Central, where it was unloaded by the electric car dumper of all steel construction on a concrete foundation shown in the lower photo. Conveyance to the dam was by ten diesel trucks each pulling a 24-ft. flat bed semi-trailer with a capacity of three 5-ton skips. The trailers were loaded with a 2-yd. shovel.

Arriving at the dam, the riprap was placed on the upstream slope by use of the cableway system shown in the top view. The head tower was mounted on rails on the 40-ft. crown of the dam and the tail tower on crawlers at the dam's toe. The head tower was powered by electricity; the tail tower by a gasoline motor.

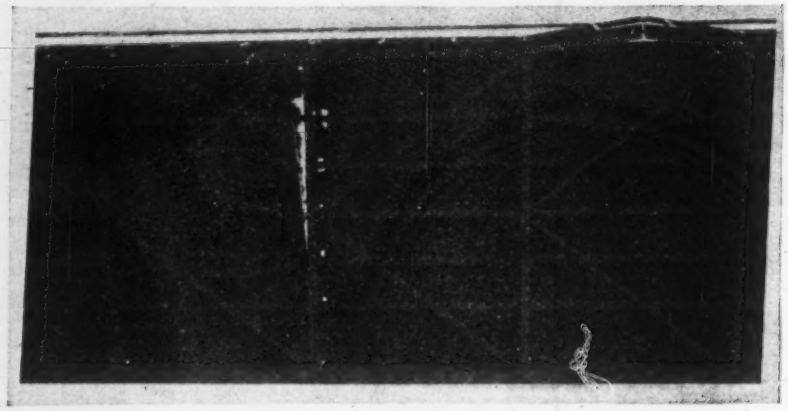
After the loaded trucks had been driven in front of the head tower, the skips were removed one at a time. Dumping on the slope was accomplished by lowering the skip to the earth and unhooking two corner chains, then raising the skip by the remaining two chains to spill the rock in place. Little hand-placing was necessary.

The Sardis project is under the supervision of the District Engineer, U. S. Engineer Office, Vicksburg, Miss. Alvin D. Hall was superintendent for the contractors.

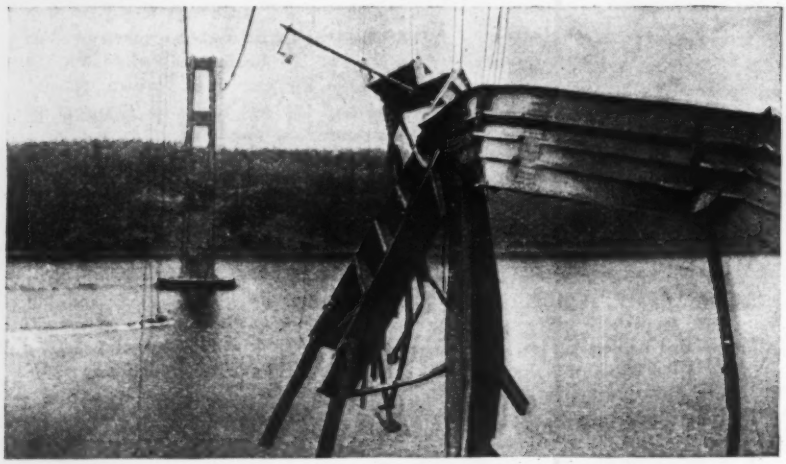
Details of damage to Tacoma Narrows Bridge



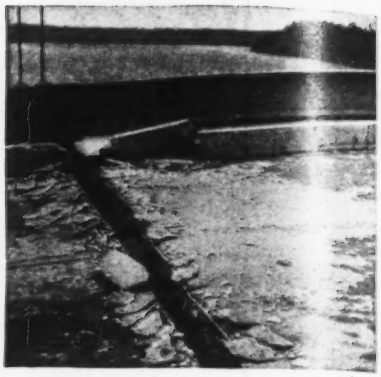
A 2½-ft. buckle of the stiffening girder on the south side of the sagging east side span. Note break in roadway.



Looking up from the water level at buckled girder shown in above view. Remarkable buckling of the stringers without any deformation in the diagonals is shown.

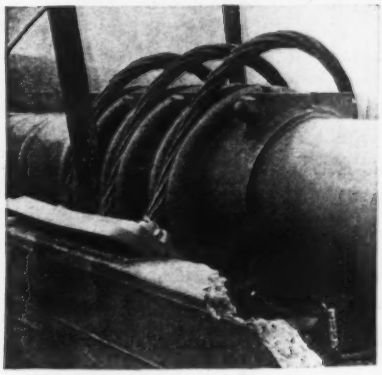


Shattered floor system hanging from twisted stiffening girders 250 ft. out from east tower. Ends of the suspenders are stranded, showing that they were broken in tension.



Looking along roadway crack shown in top photo at left. Greater width of separation on far (south) side is shown.

TO SUPPLEMENT the descriptions of the collapse of the Tacoma Narrows Bridge on Nov. 7 that were published in previous issues of *Engineering News-Record*, these pictures are published. Four of them were taken by N. A. Bowers, Pacific Coast editor, *ENR*, on his visit to the bridge following its collapse. Bowers' earlier reports were published in the issues of Nov. 14, p. 647, and Nov. 21, p. 674.



Damage where south cable first contacts concrete of east abutment. Broken housing indicates bouncing of cable.

More than a billion dollars of defense work under way

Program calls for expenditure of two billion dollars for defense construction through June 30, 1942

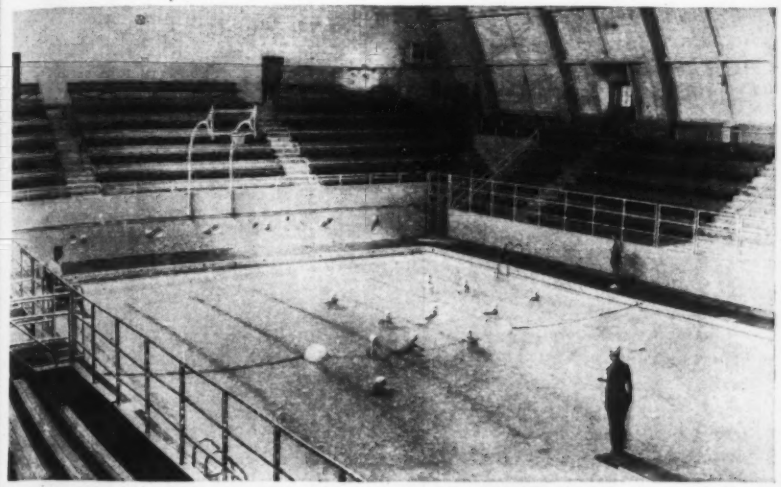
A report last week by the National Defense Advisory Commission on the two billion dollar defense construction program shows that on Nov. 1 more than half of the work was under way. These projects are for providing troop quarters, air and naval stations, plant facilities for manufacturing airplanes, tanks, ammunition and other military supplies, and facilities for construction of ships and other defense needs.

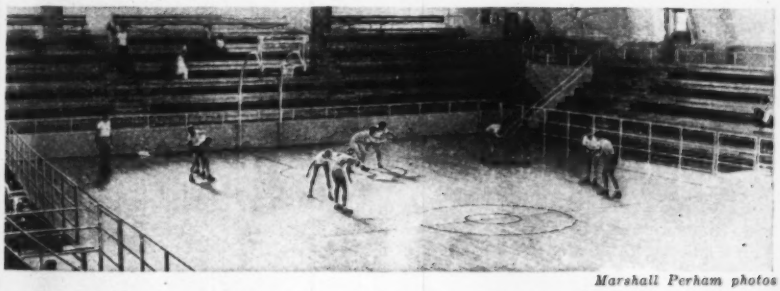
The largest single classification under the construction program is the building of quarters for the trainees, which will require a total of $631,000,000 in housing. This work includes shelters for the National Guard, the expanded regular Army, increased quarters for Navy personnel, as well as the trainees under the selective service program.

The second largest classification is $520,000,000 for construction of "productive facilities", such as airplanes, engine plants, armored tanks, ammunition and loading plants, shipways and shipyard facilities. The third classification is $337,000,000 for airbases. A fourth calls for the expenditure of $250,000,000 of "other military construction", and the fifth classificaton in the breakdown shows that $240,000,000, including land costs, is available for defense housing. This is expected to provide 65,000 of the 70,000 dwelling units necessary for defense workers and families of enlisted men. Almost $100,000,000 appropriated for Army and Navy defense housing has been allocated and construction is under way on thousands of units.

Other defense construction

In addition to the two billion dollar defense construction program covered by direct appropriations or contract authorizations, there are numerous other government financed construction activities related to defense. The Civil Aeronautics Authority has $40,000,000 for new civil airports, which contribute to the total air facilities of the country. WPA has been spending a similar sum annually for work on airports and airways. In addition there is the extra set of locks for the Panama Canal, which is part of the total picture.





Marshall Perham photos

Movable floor covers pool to provide gymnasium floor

To make possible a swimming pool and a gymnasium within the same space and to permit use of the same spectator seats, two movable floor sections 50 ft. wide by 48 ft. long were used in the Beverly Hills (Cal.) high school sports building. Each floor section is carried on six sets of steel trucks traveling on stainless steel tracks set flush with the pool deck. The sections, operated electrically with a reversible motor and cable, are provided with interlocking switches to prevent moving the floor until springboards are lowered, and the guard rails and gates closed. When it is desired to use the pool facilities the gymnasium floor sections retract into pockets under the spectator stands. The swimming pool is a regulation pool with tile lined walls and floor.

The main building is 148 ft. 8 in. long by 108 ft. wide with a 26x62-ft. wing at each end. The exterior walls of the building are of reinforced concrete and the roof is of steel arch construction.

Above photos show both gymnasium floor and swimming pool facilities being used. Note the back board still in place while the swimming pool is being used.

The $160,000 structure was built as a PWA project with Stiles Clements the architect. Contractors included Baruch Corp., Paddock Engineering Co., and the Pennsylvania Steel Co.

• • •

Labor trouble halts Nantahala Dam work

Work was suspended Nov. 19 on the $6,500,000 hydro-electric project being built on the Nantahala River in western North Carolina, following a day of fighting in which western and southern workers on the job are said to have joined in an attempt to oust northern skilled workers. Fighting broke out Nov. 18 in an attempt to drive the northern workmen from their jobs, and it was reported that many of them had left after being paid off. James Workman, 35, a welder from Pennsylvania on the project, was shot to death in the yard of his home Nov. 21. Law enforcement officers expressed the opinion that the shooting was connected with the trouble at the dam.

Conferences have been called by Governor Hoey of North Carolina in an effort to settle the difficulties and a number of state highway patrolmen were dispatched to the scene.

The 270-ft. dam is being built near Andrews, N. C. by the Nantahala Power & Light Co., a subsidiary of the Aluminum Co. of America. The dam is designed to serve aluminum plants at Alcoa, Tenn. and Badin, N. C. where defense orders are to be filled. The project is being constructed by the Utah Construction Co. with A. H. Ayres, job manager, and B. R. Putnam, construction superintendent.

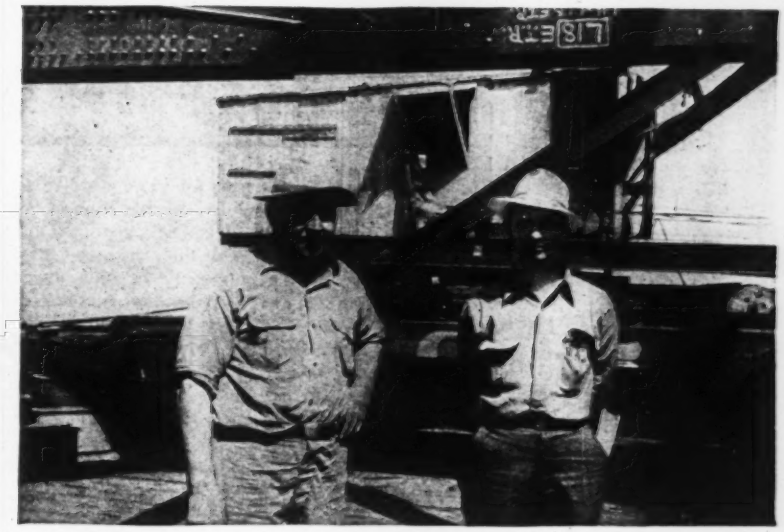
MEN AT WORK

CAPT. A. G. TRUDEAU (left), U. S. Engineers, and GUY F. ATKINSON, contractor on Mud Mountain Dam near Tacoma, Wash., are standing on the catwalk that spans the dam site 380 ft. above the river bed. The plan for an earth fill type of dam has been abandoned in favor of a rock fill structure with a rolled-earth core. Since this picture was taken Capt. Trudeau has been transferred to Camp Ord.

L. E. GEMMILL (left), Denver water sampler, uses chlorine comparator for quickly determining chlorine residue. In using the instrument, a procedure developed by George J. Turre, sanitary engineer of the Denver Board of Water Commissioners, is followed.

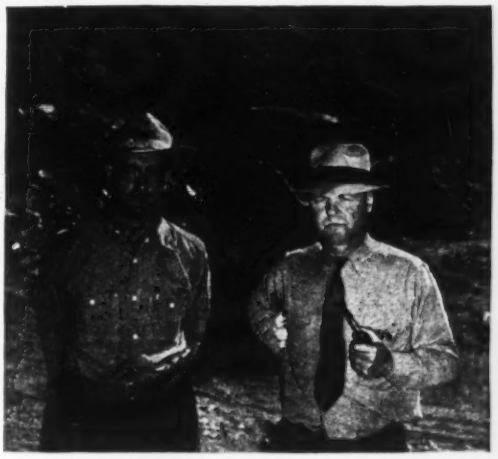
New Yorkers didn't have a look-in on their own Delaware Aqueduct water supply tunnel until Samuel R. Rosoff, Ltd. finally landed the last of the 11 contract sections. This job is being driven from Shafts 2, 2A and 3, and the tall blond FRED STIEFEL, (at right) engineer, is in charge for Rosoff.

Their main job is the third set of locks for the Panama Canal. COL. R. A. WHEELER (left), engineer of maintenance on the Canal for the U. S. Engineers, and BRIG. GEN. GLEN E. EDGERTON, governor of the Canal, discuss a few of the many problems of the $277,000,000 project.



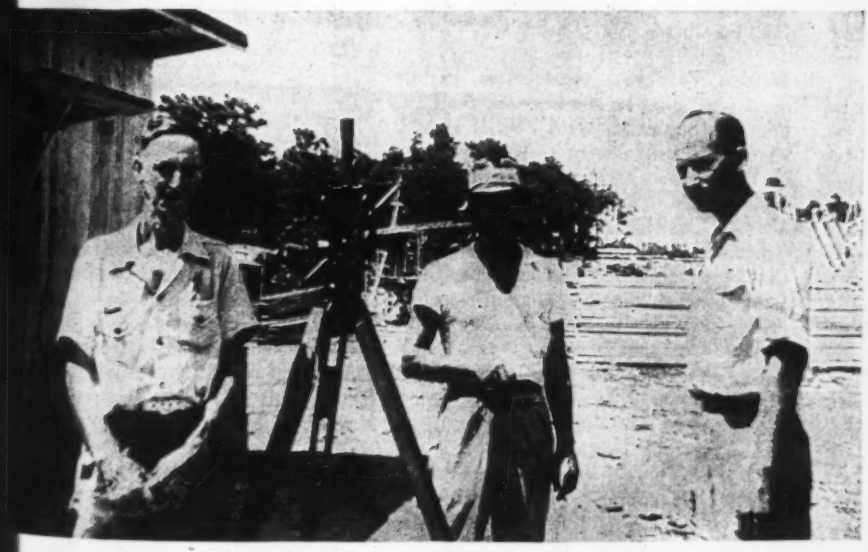
At the Ludlow Ferry Bridge project on the Potomac River fifty miles below Washington, D. C. operations of the Harris Structural Steel Co. of New York were directed by R. H. SMITH (left above), superintendent, and E. ADAMEC, engineer, pinch hitting for Field Engineer Ed. Geuber, who was in the hospital due to an accident.

If the next flood passes through Johnstown, Pa. without wrecking the city C. M. WELLONS (left above), principal engineer in the Pittsburgh district office of the U. S. Engineers, and J. F. LEONARD, engineer of bridges and buildings of the Pennsylvania R. R., will be mighty pleased.



job of MILTON R. HAYES (left), superintendent for C. A. Switzer, Denver, and R. E. WOTHAM, resident engineer, Colorado Highway Department, at the present is the spectacular relocation of Colo- Route 4 over Battle Mountain near Red

BEN S. MORROW (above), city engineer of Portland, Ore., has a new problem in public relations. On Oct. 1 the city made its first collection of a monthly charge for sewer connections with plan to raise $130,000 in 12 months to pay for surveys and studies of an intercepting sewer and sewage disposal system.



H. E. WELLS (left), representative of the Constructing Quartermaster Corps, U. S. Army; DAVIS MOSBY (center), superintendent for the Ward Construction Co., Tampa, Fla., and R. W. ERICKSON, general superintendent for Ward Construction, are pictured at work on the $1,250,000 Orlando, Fla., army airbase.

MEN AND JOBS

JIM C. LAGOS, draftsman in the bridge office of the Wyoming State Highway Department since July 1, 1940, on Nov. 1 resigned to become engineer draftsman at the U. S. Navy Yard, Bremerton, Wash. Lagos received a B.S. degree in civil engineering from the University of Wyoming in June.

O. GRAHAM, Montreal, Que., has been made chief engineer of the Quebec Running Streams Commission. He succeeds P. E. Bourbow, who died in November, 1938.

T. E. ERST, for the past 7 years secretary and engineer of the New Orleans city department of public utilities, last month began new duties in Washington with the Quartermaster Corps, U. S. Army, as materials and expediting engineer with Section C. Erst is a graduate of the engineering school of the University of Alabama and was originally with the Louisiana State Highway Commission.

RAYMOND LATREILLE, civil engineer, has been appointed chief engineer of the hydraulic service of the Department of Land and Forests of the Province of Quebec with offices at Quebec City. Latreille, who graduated from Ecole Polytechnique of Montreal in 1922, spent a few years on construction of dams and power houses and then joined the hydraulic service in 1925 to be with that department ever since. EUCLIDE PARE, civil engineer, has been named to take over Latreille's old duties. Paré graduated from Ecole Polytechnique of Montreal in 1935 and since then has been a member of the hydraulic service.

HERMAN G. IRWIN, assistant to the chief engineer, New York City Board of Water Supply, retired Oct. 31. Irwin, a graduate of the College of the City of New York and Columbia University, for two years worked with John B. Snook's Sons, architects of New York City. In 1906 he began his long career with the board of water supply. Recently he has been editor of the Delaware Water Supply News.

RONALD M. PECK of Wolfville, N. S., has been appointed instructor in civil engineering at Acadia University, Wolfville. He is a graduate of Acadia and for a time studied at McGill University, Montreal.

T. R. STEEVES, until recently a member of the teaching staff at Acadia University, Wolfville, N. S., has joined the technical staff of the Royal Canadian Air Force to be stationed at the Trenton, Ont., airbase.

W. I. SWANTON, associate civil engineer with the Bureau of Reclamation at Washington, D. C., retired Sept. 30. After graduating from the Massachusetts Institute of Technology in 1893, Swanton was engaged on the construction of the Boston & Albany R.R. Later he worked with the Union Bridge Works, Edgemoor Bridge Works, and the Bureau of Yards and Docks, U. S. Navy. He had served a total of 35 years with the U. S. Supervising Architect's Office and the Bureau of Reclamation.

BLAKE R. VAN LEER, dean of the school of engineering at North Carolina State College, has been appointed regional adviser for the engineering defense program of the U. S. Office of Education. He will be in charge of the program for Region No. 8, which embraces Virginia and the two Carolinas.

LIEUT. MAURICE R. MONTGOMERY, civil engineering corps, U. S. Naval Reserves, Alhambra, Cal., has been ordered to active duty in the Eleventh Naval District, Naval Operating Base, San Diego, Cal.

LIEUT. IRVIN S. RASMUSSON, civil engineering corps, U. S. Naval Reserves, Russellville, Ark., has been ordered to active duty at the Navy Yard, Philadelphia, Pa.

LIEUT. CHARLES E. LEWIS, civil engineering corps, U. S. Naval Reserves, Mitchell, S. D., has been ordered to active duty in the Thirteenth Naval District, Seattle, Wash.

LIEUT. BERNHARD O. ROESSLER, civil engineering corps, U. S. Naval Reserves, Huntington, W. Va., has been ordered to active duty at the Naval Air Station, Hampton Roads, Va.

W. JOE PREVETTE, construction engineer with WPA at Lumberton, N. C., has been appointed WPA district manager with headquarters at Wilmington, N. C. He succeeds L. J. JORDAN, who has resigned.

ROBERT L. MACDOUGAL of Atlanta, Ga., has been appointed regional director for Region 5 for the Work Projects Administration. Region 5 is Alabama, Florida, Georgia, Kentucky, North Carolina, Tennessee and South Carolina. MacDougal was former administrator for the state of Georgia.

F. J. JEROME has been appointed assistant chief engineer for the territory of Ohio, Indiana and Illinois divisions of the New York Central R. R. His headquarters will be in LaSalle St. Station, Chicago. GEORGE H. HARRIS is chief engineer of the New York Central.

PAUL HAMILTON, former assistant chief engineer, has begun new duties as district engineer of the territory embracing the Ohio, Indiana and Illinois divisions of the New York Central R. R. His headquarters will be at Cincinnati.

LIEUT. PAUL BENNETT, civil engineering graduate of Rose Polytechnic with the class of 1936, is now acting as assistant professor of military science and tactics at that school. Following his graduation, Bennett worked with the Milwaukee R. R. on right-of-way maintenance in Chicago. For a time he supervised CCC work with headquarters at Fort Benjamin Harrison. He replaces LIEUT. JAMES B. HAGAN, who has been transferred to the 17th Armored Battalion, Fort Benning, Ga.

MAJ. J. F. PLOW, civil engineer who commanded the 1st Medium Battery, 2nd Montreal Regiment, R.C.A., at the outbreak of the present European War and later was promoted to command the 1st 57th Battery, has been made second-in-command of the 2nd Medium Regiment. Major Plow, who graduated from the Royal Military College of Kingston, Ont., was assistant general secretary of the Engineering Institute of Canada from 1930 to 1938, when he accepted a position with Charles Warnock & Co., Ltd., in Montreal.

V. S. CHESNUT, senior engineer with the National Harbour Board, St. John, N. B., has been appointed acting secretary-treasurer of the St. John branch of the Engineering Institute of Canada to replace F. L. BLACK, who is now located at Shawinigan Falls, Que. Chesnut has been with the St. John Harbour Board since 1930.

A. T. CAIRNCROSS, civil engineer, has joined the engineering staff of the Aluminum Co. of Canada to be stationed at Arvida, Que.

EDWARD BARTOW, head of the University of Iowa department of chemical engineering and former president of the American Waterworks Association, has been granted a leave of absence to join the research laboratories of Johns-Manville Corp., Manville, N. J. Bartow, also a former president of the American Chemical Society, also taught at Williams College, the University of Kansas, and the University of Illinois. During the World War Bartow saw service in France with the sanitary corps of the American Expeditionary Forces.

JOBS OF THE WEEK

SMALL ARMS PLANT, Independence, Kan.

Walbridge-Aldinger Co., Detroit, Mich., and Foley Bros., Inc., St. Paul., Minn., were awarded the contract by Remington Arms Co., Inc., Bridgeport, Conn., for constructing a small arms ammunition plant. Construction will cost $7,500,000, and total cost will be $10,000,000. The War Department, Washington, D. C. awarded the operation contract to Remington Arms Co.

SANTEE-COOPER TAILRACE CANAL, South Carolina

W. E. Callahan Construction Co., Los Angeles, was low bidder Nov. 20 on the first section of the 14-mile tailrace canal below the power house of the Santee-Cooper Project, $1,024,250; Atlantic Dredging & Construction Co., Washington, was low bidder on the second section, $332,950; and McWilliams Dredging Co., Chicago, was low on the third section, $2,467,500. J. A. Tertelling & Sons, Boise, submitted a low bid of $1,674,425 on an alternate including the first and part of the second section. The project is being built by the South Carolina Public Service Authority.

AIRPLANE FACTORY, Tonawanda, N. Y.

John W. Cowper Co., Inc., Buffalo, was awarded a contract by Curtiss Aero Division of Curtiss-Wright Corp., Buffalo, for constructing the following 1-story buildings: 600x1,400 ft.; 200x233 ft.; 100x900 ft.; 100x150 ft.; 80x120 ft.; and 100x100 ft. Estimated cost of the work is $8,000,000.

PLANT, Long Beach, Calif.

P. J. Walker Co. Los Angeles, Calif., received the contract from Douglas Aircraft Corp., Santa Monica, Calif., for constructing a new plant on a 142-acre site on Lakewood Blvd. Estimated construction cost $6,000,000; total cost of the plant is $11,254,700. The War Department originally awarded the contract to Douglas Aircraft for its subsidiary Western Land Improvement Co.

DREDGING AND RIPRAP, South Carolina

Central Engineering Co., Davenport, Ia. with a bid of $2,138,857 and Cornell-Young Co., Macon, Ga., bidding $1,439,525 were awarded individual contracts for the dredging and riprap work for Santee and Pinopolis Reservoirs. The work is part of the Santee-Cooper Project being done by South Carolina Public Service Authority.

DAM and SPILLWAY, Kanapolis, Kan.

Marsch, Peterson, Walker & Condon, Chicago, Ill., were low bidders at $4,889,978 for constructing Kanapolis Dam and spillway for the U. S. Engineers, Kansas City, Mo.

SHELL LOADING PLANT, Burlington, Ia.

A. Guthrie & Co., Inc., St. Paul, Minn. and Al Johnson Construction Co., Minneapolis, Minn., were awarded a joint contract by the War Department, for constructing a shell-loading plant. Estimated cost of the work is $1,500,000. A $20,000,000 contract for operation of the plant went to Day & Zimmerman, Inc., Philadelphia, Pa.

AIR CORPS CANTONMENT, West Palm Beach, Fla.

Watt & Sinclair of Florida, Inc., Palm Beach and Cleary Bros. Construction Co., West Palm Beach, will construct the air corps cantonment for the War Department, Washington, D. C., under terms of a $1,500,000 contract.

IRRIGATION PROJECT, North Dakota

Bureau Reclamation, Denver, Colo., is constructing the $1,500,000 Trenton-Buford irrigation project 20 mi. northwest of Williston with WPA labor.

HOUSING FACILITIES, Brownwood, Tex.

Robert E. McKee, El Paso and Brownwood, Tex., received a $4,000,000 contract for the housing facilities to provide quarters for 12,000 more men at Camp Bowie. McKee a short time ago received a $5,050,000 contract for housing 18,000 men. Thus the cost of all Camp Bowie housing is $9,050,000.

WAREHOUSES, Ogden, Utah

Al Johnson Construction Co., and Leck Co., both of Minneapolis, will construct eight warehouses at the general army supply depot in connection with Hill Field Arsenal Air Depot work under terms of a $1,705,000 contract.

CANTONMENT, Portland, Ore.

Hauser Construction Co., George H. Buckler Co. and Natt McDougal Co., all of Portland, Ore. were awarded a $1,142,045 contract for constructing the temporary Air Corps cantonment for the War Department, Washington, D. C.

HOUSING UNITS, South Charleston, W. Va.

Engstrom & Wynn and J. A. J. Construction Co., Wheeling, W. Va., were awarded a $1,527,000 contract by the Bureau of Yards and Docks, Navy Department, Washington, D. C. for constructing 50 housing units for enlisted men and 400 housing units for civilian personnel.

NOTE—Additional bidding and contract news on over 800 projects large and small, appear in the Construction News Section beginning on page 14.

New WPA chief engineer

Perry A. Fellows, former city engineer of Detroit and one time manager of the Detroit city airport, has been promoted from assistant chief engineer to chief engineer of the Work Projects Administration. His appointment comes after seven years of service with the federal works program, since in 1933 he went to Washington to become regional engineer for the Civil Works Administration. With the changeover to WPA, Fellows was made assistant chief engineer of that organization. Before being appointed city engineer of Detroit in 1925, a position held until 1931, Fellows served on the Detroit port development committee of the Detroit Board of Commerce. In 1931 he was transferred to the Detroit city airport as engineer manager. He is a graduate of the University of Michigan.

Fellows replaces Col. Edmund H. Leavey, who has been assistant commissioner and chief engineer of the WPA since last July. Colonel Leavey will return to army duty. Leavey's work as assistant commissioner will be taken over by Francis H. Dryden, regional director of the WPA, who has been a regional director for the WPA for Delaware, Maryland, the District of Columbia, Virginia and West Virginia. He also served as state administrator for Maryland.

Board named to study Tacoma bridge collapse

The Public Works Administration has named a three-man board to study the collapse of the $6,400,000 Tacoma Narrows Bridge across Puget Sound. Members of the board are: Othmar H. Ammann, director of engineering, New York Port Authority; Theodore Von Karman, director of the Daniel Guggenheim Aeronautical Laboratory at California Institute of Technology; and Glenn B. Woodruff, engineer of Berkeley, Calif., employed on the design of the San Francisco-Oakland Bay Bridge.

PWA made a grant of $2,800,000 to finance the project.

OBITUARY

GEORGE W. REED, 82, retired building contractor in the Los Angeles area, died Nov. 17.

GEORGE R. HAWKINS, 48, civil engineer with the Kansas State Highway Department, died in Moran, Kan. Nov. 20. He was superintendent of construction of overpasses and other major highway projects in southeastern Kansas.

COL. EDWARD C. G. CHAMBERS, 53, director of engineering services of the Canadian Army, died Nov. 21 at Ottawa. He served with the Royal Canadian Engineers during the World War.

WILLIAM M. RAPP, 69, superintendent of construction and distribution of the Atlanta, Ga. waterworks system, died last week. He had been with the city waterworks system continuously for 55 years. He was appointed superintendent of construction and distribution in 1905.

HOLLIS FRENCH, 72, for many years consulting engineer in the field of power plant and institutional building design and construction, and senior partner in the office of Hollis French, Boston, died in that city Nov. 21. He graduated from Massachusetts Institute of Technology in 1889.

FREDERICK W. MARK, president of F. W. Mark Construction Co., Philadelphia, died last Saturday in that city.

HUBERT H. POLK, engineer with the Mississippi State Highway Department since 1935, was killed in an automobile accident near Calhoun City, Miss. Nov. 19.

STANLEY D. PACE, president of Cumberland Construction Co., Burkesville, Ky., died at Uno, Ky. Nov. 17.

THOMAS T. HUNTER HARWOOD, 76, formerly associated with the U. S. Engineers for 35 years, died November 21 in Rockport, Mass. He first went to Rockport in 1885 to conduct a survey for army engineers for the Sandy Bay breakwater project.

ANDREW M. ANDERSON, 56, vice president of the Elgin Corp., sales organization for the Elgin Sweeper Co., died in Chicago Nov. 21. In 1917 he was secretary of the International Association of Street Cleaning Officials, later changed to the International Association of Public Works Officials, which in 1937 joined with the American Society of Municipal Engineers to form the existing American Public Works Association.

Ohio bridge studied for Mauckport, Ind.

When highway and bridge commissioners of the states of Indiana and Kentucky held a meeting at Corydon, Ind. recently, it was decided that traffic on Indiana State Route 135 and U. S. Highway 60 in Kentucky was sufficient to support a proposed toll bridge across the Ohio River at Mauckport, Ind. The bridge was given additional support by the fact that it would make possible a much better highway connection between Fort Benjamin Harrison at Indianapolis and army headquarters at Fort Knox, Ky. It would reduce traveling time between the two points by about four hours.

In studying the connecting route between the two army posts, army officials and engineers said that State Route 135 in Indiana and U. S. 60 in Kentucky were the only highways in that portion of the Ohio River valley not flooded during the 1937 floods.

The cost of the bridge is estimated at $1,500,000.

CONTRACTS AND CAPITAL

ENGINEERING CONSTRUCTION awards for the week total $89,303,000, an increase of 55 per cent over the corresponding 1939 week, and the 13th consecutive week in which current awards have topped their respective 1939 values by substantial margins.

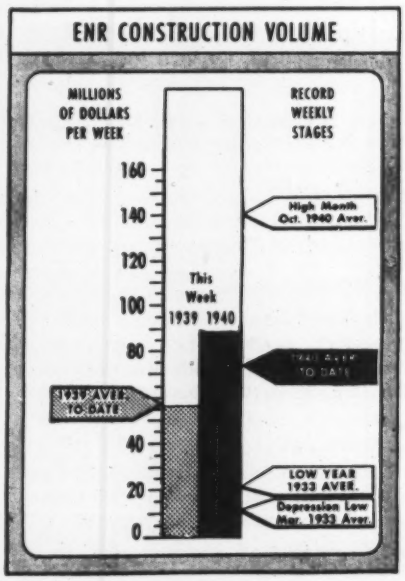
Private construction tops the 1939 week by 56 per cent as a result of the increased volume of industrial and commercial buildings. Public awards are 55 per cent higher due to the high volume of public buildings.

Construction for the year to date, $3,588,539,000, exceeds the 48-week 1939 total by 28 per cent. Private awards for the period are 28 per cent higher. Public construction gains 27 per cent over a year ago as a result of the 272 per cent increase in federal work.

In the classified construction groups, waterworks, industrial, public and commercial buildings, earthwork and drainage and unclassified work top their totals of a year ago; and waterworks, sewerage, bridges, industrial and commercial buildings, earthwork and drainage, and streets and roads gain over their respective volumes for the short preceding week.

New capital for construction purposes for the week totals $10,111,000, a decrease of 48 per cent from the volume for a year ago. The current week's financing is made up of $7,111,000 in state and municipal bonds, and $3,000,000 in corporate security issues.

New construction financing for the year to date, $3,610,990,000, tops the total for the 48-week 1939 period by 53 per cent.



CONTRACTS

(Thousands of dollars)

	Week Ending Nov. 30 1939	Nov. 21 1940	Nov. 28 1940
Federal	$6,674	$48,212	$27,411
State & Municipal	30,105	12,487	29,514
Total public	$36,779	$60,699	$56,925
Total private	20,722	13,958	32,378
TOTALS	$57,501	$74,657	$89,303
Cumulative 1940 (48 weeks)			$3,588,539
1939 (48 weeks)			$2,812,529

Note: Minimum size projects included are: Waterworks and waterways projects, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

NEW PRODUCTIVE CAPITAL

	Cumulative 1939 48 Wks.	1940 48 Wks.
NON-FEDERAL	$1,224,889	$1,329,029
Corp. Securities	204,483	226,640
State & Mun.	531,265	463,781
R.E.A. loans	89,445	40,000
U.S.H.A. loans	201,647	218,704
R.F.C. loans	8,049	195,904
Fed. Aid-Hwy	190,000	184,000
FEDERAL	$1,128,028	$2,281,961
TOTAL CAPITAL	$2,352,917	$3,610,990

FHA MORTGAGES

	Week Ending Nov. 25 1939	Nov. 16 1940	Nov. 23 1940
Selected for appraisal	$16,135	$29,136	$18,780*
Cumulative 1940 (47 weeks)			$1,171,945*
1939 (47 weeks)			$1,040,773

* Subject to revision.

ENR INDEX NUMBERS

			1913	1926
Index Base=100				
Construction Cost	Nov., '40	247.24		118.85
Building Cost	Nov., '40	206.24		111.49
Volume	Oct., '40	450		215

CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

GRADE ELIMINATION ROCKAWAY BEACH, N. Y.

OWNER: Long Island Railroad Co., and New York Transit Commission, New York, N. Y.

PROJECT: Construction of steel and concrete viaduct and bridges, stations, platforms and appurtenances in connection with Rockaway Beach Grade Elimination (Contract 5) from Beach 54th St. to Mott Avenue, Borough of Queens, New York, N. Y. Involves installation of tracks, duct lines and manholes; removal of temporary tracks and station facilities; and demolition and alteration of buildings, removal and relocation of fences and other encumbrances.

CONDITIONS: The railroad company will furnish all track material, except ballast; third rail material; and guard rail. Contractor to furnish all other material required in his portion of work. Railroad company's part of work includes: signal installation; third rail complete; bond tracks and third rails; changes in electric lines, telephone and telegraph; maintenance of tracks; track cuts and connections; and install turnouts and crossovers where required. Contractor to complete work within one year. Operating schedule of railroad must be maintained. Work train service available to contractor at extra cost. Street crossings to be maintained, and adequate warning signs provided. Field office to be constructed. Wage rates are those prevailing in locality.

BIDS: Six bids were opened September 26, 1940, ranging from the contract low of $2,799,019 to $3,260,122.

LIST OF BIDDERS:

1. Charles F. Vachris, Inc., Brooklyn, N. Y. (contract). $2,799,019
2. Tully & Di Napoli, Inc., Long Island City, N. Y. 2,822,176
3. P. T. Cox Constr. Co., Inc., New York, N. Y. 2,934,548
4. The P. J. Carlin Constr. Co., and Cogan Bros., Inc., New York, N. Y. 3,019,095
5. Rusciano & Son Corp., Bronx, N. Y. 3,048,520
6. Pairier & McLane Corp., New York, N. Y 3,260,122

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Clearing site	L.S.	$20,000.00	$20,600.00	$10,000.00
2. Unclassified excavation	2,000 c. y.	.01	1.10	2.00
3. Foundation excavation	22,000 c. y.	3.80	6.20	6.00
4. Precast concrete piles	100,000 l. f.	1.36	1.05	1.65
5. Class A concrete	30,000 c. y.	13.50	16.80	17.00
6. Class B concrete	13,000 c. y.	11.00	6.25	9.00
7. Structural steel	13,000 ton	100.00	92.50	96.00
8. Reinforcing steel	3,400,000 lb.	.046	.045	.05
9. Wire mesh reinforcing	330,000 lb.	.12	.14	.15
10. Splicing chamber fittings	32,000 lb.	.19	.35	.15
11. Waterproofing with protect. crse.	240,000 s. f.	.30	.29	.26
12. Steel railing, type A	1,800 l. f.	5.00	4.75	5.50
13. Steel railing, type B	1,900 l. f.	5.40	5.65	5.30
14. Steel railing, type C	1,000 l. f.	5.60	6.30	6.00
15. Standard pipe railing, 2 rail	16,000 l. f.	1.25	1.15	1.30
16. Handrail, 1 pipe	2,200 l. f.	.85	.90	1.00
17. Lighting standard, type A	75 ea.	12.25	7.80	12.00
18. Lighting standard, type B	12 ea.	10.00	8.00	10.00
19. Deck drains, complete	390 ea.	60.00	52.00	45.00
20. Fibre conduit, 3¼-in. dia.	66,000 d. f.	.25	.25	.25
21. Fibre conduit, 4-in. dia.	71,000 d. f.	.26	.26	.27
22. Galv. wr. iron pipe, 3½-in. I. D.	600 l. f.	4.00	3.00	3.00
23. Galv. wr. iron pipe, 4-in. I. D.	50 l. f.	3.50	4.00	5.00
24. Track removed	20,000 l. f.	.18	.23	.25
25. Track laid and surfaced, stone ballast	19,500 l. f.	1.85	2.80	2.90
26. Guard rail installed	19,500 l. f.	.25	.15	.13
27. Third rail removed	20,000 l. f.	.05	.15	.12
28. Handling third rail	19,500 l. f.	.05	.10	.08
29. Crossover installed, stone ballast.	L.S.	1,000.00	1,200.00	1,150.00
30. Cinder walk	300 s. y.	.50	.75	1.00
31. Concrete sidewalk	2,000 s. f.	.17	.20	.30
32. Concrete curb	200 l. f.	.75	.65	1.00
33. Misc. iron and steel	5,000 lb.	.10	.08	.12
34. Misc. timber and lumber	20 Mbm.	75.00	90.00	100.00
35. Miscellaneous cinders	1,000 c. y.	1.25	1.40	1.75
36. Integral waterproofing	50 gal.	.01	.80	1.25
37. Right-of-way fence	2000 l. f.	.25	.30	.30
38. Necessary restoration	L.S.	5,000.00	10,000.00	3,000.00
39. Bitum. macadam M.M., type 3.	300 ton	7.00	7.25	9.00
40. Station and platform lighting (3 sta.)	L.S.	7,500.00	9,200.00	9,000.00
41. Use of crane	200 hr.	8.00	7.85	9.00
42. Portland cement	67,000 bbl.	2.10	2.00	2.25
43. High early strength cement	100 bbl.	3.00	3.25	3.50
44. Station finish (3 stations)	L.S.	84,500.00	120,000.00	100,000.00
45. Street lighting facilities	L.S.	9,000.00	7,000.00	5,000.00
46. Demolition or cutting back of 17 buildings within "taking line"	L.S.	26,000.00	15,200.00	8,300.00

TULE LAKE TUNNEL OREGON-CALIFORNIA

OWNER: Bureau of Reclamation, Modoc Division, Klamath Project, Oregon-California, Klamath Falls, Ore.

PROJECT: Construction of approximately 6,600 feet of Tule Lake Tunnel, Modoc Division, Klamath project, Oregon-California, located about 23 miles southeast of Klamath Falls, Ore. Project involves open cut excavation for portal structures and transitions; tunnel excavation; steel and timber tunnel supports; steel tunnel-liner plates; concrete in tunnels and structures; grouting; drainage structures; and backfilling.

CONDITIONS: Owner to furnish cement, sand, reinforcing bars; sewer pipe for drains; pipe and fittings for pressure-grouting operations and for weep pipes. Contractor to furnish balance of material and complete work in 500 calendar days. Access to site of work from existing roads to be provided by contractor. Wage rates are: skilled labor, $1.00 to $1.50 per hr.; semi-skilled, 75 to 90c. per hr.; and common labor, 62½c. per hr.

BIDS: Seventeen bids were received September 27, 1940, ranging from the low of $172,096 to $360,555.

LIST OF BIDDERS:

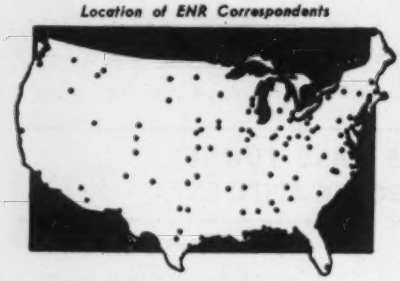
1. J. A. Terteling & Sons, Boise, Idaho $172,096
2. Sam Orino, Portland, Ore 188,185
3. Wixson & Crowe, Shasta Dam, Calif 191,515
4. T. E. Connolly, Inc., San Francisco, Calif 191,813
5. Swan A. Dahlberg, San Francisco, Calif 197,773
6. Ralph A. Bell, Redding, Calif 223,625
7. Benjamin H. Sheldon, Spokane, Wash 226,315
8. Thompson-Markham Co., Los Angeles, Calif 254,120
9. Elliott Stroud-Seabrook, Los Angeles, Calif 269,705
10. C. A. Dunn, Klamath Falls, Ore 271,331
11. Schweitzer, Werner & Webb, Los Angeles, Calif 278,445
12. The Arundel Corp. & L. E. Dixon Co., Marysville, Calif. 282,770
13. Floyd Shofner, Los Angeles, Calif 287,897
14. Winston Bros. Co., Los Angeles, Calif 305,998
15. Nat McDougall Co., Portland, Ore 307,946
16. Stiers Bros. Constr. Co., St. Louis, Mo 342,495
17. United Concrete Pipe Corp., Los Angeles, Calif 360,555

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Common excavation, open cut	14,000 c. y.	$0.25	$0.40	$0.25
2. Excavation, rock, open cut	300 c. y.	1.00	.75	5.00
3. Excav., all classes, in tunnel	10,050 c. y.	10.52	11.00	12.40
4. Permanent steel tunnel supports	115,000 lb.	.08	.07	.08
5. Permanent timbering in tunnel	60 Mbm	80.00	40.00	100.00
6. Steel tunnel liner plates	43,000 lb.	.06	.07	.06
7. Washed gravel or spalls outside of plate steel tunnel-liner plates	65 c. y.	2.00	6.00	4.00
8. 6-in. dia. tunnel drain	2,000 l. f.	.50	.10	1.00
9. 6-in. sewer pipe, cemented joints	100 l. f.	1.00	1.00	.50
10. Concrete in portal structures and transitions	25 c. y.	25.00	20.00	30.00
11. Concrete in tunnel lining	3,100 c. y.	13.80	18.00	12.00
12. Place reinforcing bars	3,000 lb.	.03	.10	.03
13. Drill grout holes, to 10 ft	500 l. f.	1.00	1.00	3.00
14. Place grout pipe and connections	200 lb.	.20	.10	.50
15. Pressure grouting	700 c. f.	1.00	.50	3.00
16. Backfill	35 c. y.	.50	5.00	1.00
17. Puddling or tamping backfill	15 c. y.	.50	1.00	2.00

CONSTRUCTION REPORTS

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York
ELSIE EAVES, Manager *SCOTT McLEOD, Statistician*
(Daily service also available—Write for details)

Location of ENR Correspondents



Symbols and Abbreviations Include:

† Federal Government
★ Project of $500,000 or over
ENR Engineering News-Record
CD Engineering News-Record Construction Daily

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger; water supply, earthwork, waterworks, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

Classes of Construction

(Named in order of Listing)

Water Supply	Unclassified
Sewers, Waste Disposal	Latin America
Bridges, Grade Cross'gs	Public Buildings
Streets & Roads	Commercial Buildings
Earthwork, Waterways	Industrial Buildings

Stages Reported

PROPOSED: (except Streets & Roads):

BIDS ASKED (new announcements only. For full calendar, see also preceding issues of ENR);

LOW BIDDERS: All low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

WATER SUPPLY

PROPOSED WORK

Calif., Martinez—Plans $285,000 bond election, pump. plant, main pipe lines, etc. for water sys.

★**†Fla., Key West**—Navy Dpt., Wash., D. C., water line from Florida mainland to Key West. $2,000,000. Parsons, Klapp, Brinkerhoff & Douglas, 142 Maiden Lane, New York, N. Y., engrs.

Fla., Macclenny—W. F. Wells, town mgr., WW. Over $25,000.

★**Fla., Miami**—Approved bonds, exten. city water lines. $600,000. A. Orr, Jr., mayor.

Fla., Port Orange—Extensive WW imprvs., reservoir. $75,000. Russell & Axon, 4903 Delmar Blvd., St. Louis, Mo., engrs. J. Williamson, Jr., Orange Ave., Daytona Beach, resident engr. CD 11/13—ENR 11/21.

Idaho, Sandpoint—Imprv., exten. water sys. $51,011. Seeking WPA funds.

Ill., Burlington—W. C. Grams, city clk., WW sys. $42,000. Seeking WPA funds. L. A. Miller, Streator, engr.

Ia., Des Moines—R. Ramsay, city clk., hearing Dec. 2, exten. watermains outside city limits to Fort Des Moines. $25,000. J. M. Tippee, city engr.

Ia., LeClaire—$30,000 bond election Dec. 2, WW sys. CD 11/18—ENR 11/21.

Ia., Waterloo—W. J. Lang, waterworks supt., expansion, imprv. WW sys.

Kan., Leavenworth — Bd. Water Comrs., water distr. sys., laying 15,250 ft. c.i. pipe. $20,000. Black & Veatch, 4706 Bway., Kansas City, Mo., engrs.

Mo., Kirkwood (St. Louis P. O.)—A. S. Kinyon, mayor, $35,000 bond election probably about Dec. 15, watermain exten., incl. line from municipal water plant, Marshall Rd., to storage tanks, Rose Hill Ave.; also $15,000 bonds for sewage disposal plant enlargement, new tanks, drying beds, replacing motors, etc., Leffingwell plant and Sugar Creek Rd. plant. $50,000. J. P. Sparks, 137 S. Kirkwood Rd., engr.

N. J., Rahway—Cement lined, c.i. watermains, 15 hydrants, appurtenances. $44,817. WPA. J. H. Weitzen, Smith and Hobart Sts., Perth Amboy, WPA and owner's engr.

N. Y., Dansville—Bd. Water & Sewer Comrs., 7 m.g. reservoir. $45,000. C. C. Cheney, Salamanca, engr.

N. Y., New York—Dpt. Water Supply, Gas & Electricity, Municipal Bldg., watermains. $480,600. WPA. W. W. Johnston, 70 Columbus Ave., dir. Div. Operations.

N. Y., St. George—Dpt. Water Supply, Gas & Electricity, Municipal Bldg., New York, watermains, various sites. $398,279. WPA. W. W. Johnston, 70 Columbus Ave., New York, dir. Div. Operations.

N. C., Elon College—$15,000 bond election soon, water and sewer exten. to Christian College, Elon College and County High School. J. B. Long, mayor.

★**N. C., Fayetteville** — H. C. Blackwell, mayor, expanding, imprv. city water works, streets, etc., new standpipe, filter plant exten., general enlargement water sys. $365,000, fire station $50,000, repairing, constructing new streets, sidewalks, curbs, etc. $200,000. Will hold special election within 40 or 50 days to vote on $590,000 bond issue.

N. C., Mt. Holly—D. S. Beatty, mayor, water and sewer lines to Catawba Heights out of the Mountain Island Rd., etc. $82,000. Applied for WPA gr.

N. C., Rocky Mount—Voted $250,000 bonds, water plant addn. L. B. Aycock, city mgr. J. E. Sirrine & Co, Greenville, S. C., engrs. CD 10/29—ENR 10/31.

Pa., Bethlehem—Bethlehem Water Auth., City Hall, exten., c.i. watermains, service connections, etc., to site of housing project. Over $25,000. R. L. Fox, 37 E. Broad St., city engr.

Pa., Corry—G. B. Porter, city clk., purchasing, and imprv. facilities of Corry Water Co. Over $15,000. D. D. Williams, acting city engr.

Pa., Slatington—Boro Council, J. Garfield Evans, pres., water supply sys. imprvs., incl. by-pass for surface waters at watershed. $18,000.

Pa., York—York Water Co., York, acquired 234 acre watershed property, York and Springfield Twps., imprvs. for water supply sys. Over $25,000.

Tenn., Columbia—G. W. Shaw, city mgr., made preliminary survey, repairing, imprv. WW sys. $30,000. Morris Knowles, Inc., Westinghouse Bldg., Pittsburgh, Pa., engr.

Tenn., Murfreesboro—S. Cox, city mgr., new water filtration plant and pipe line. $125,000.

BIDS ASKED

Bids Asked December 5

†N. J., Fort Dix—Con. Q.M., water distr. sys. addn. from raw water pump. station at New Lisbon to filtration plant. Extended date. CD 11/20.

Bids Asked December 13

Tex., Bandera—Bandera Co. Water Control & Imprvt. Dist. 1, drilling, casing, developing deep water well. $18,000. J. W. Baretta Engineers, Inc., Natl. Bank Commerce Bldg., San Antonio, engr.

LOW BIDDERS

Colo., Denver—Bd. Water Comrs., City and County Bldg., Nov. 15, constructing Park Hill pressure conduit, from Lock Joint Pipe Co., 1716 Calif., St. **$232,688.** CD 11/12.

N. Y., Albany—Bd. Supervs., Albany Co., Court House, Nov. 15, building to house high pressure water tank at Ann Lee Home, from Cassidy & Gallagher, 11 S. Lake Ave. **$27,170.** CD 11/7.

†Washington—Con. Q.M., Fort Lewis, Nov. 13, water distr., sanitary and electrical wiring sys., water tanks, deep well turbines, 48 temporary buildings, Fort Casey and Fort Flagler, from MacDonald Building Co., 1517 S. Tacoma Way, Tacoma. **$307,682.**

Wash., Seattle—Bd. P. Wks., Nov. 14, watermains, 12 Ave. S. W., from Valley Constr. Co., 4354 Henderson St. **$47,104.** Est. $56,288. CD 11/7.

CONTRACTS AWARDED

Ill., Towanda—Water supply line, distr. sys., **WPA. $67,627.**

Mass., Boston—Commonwealth of Massachusetts, Metropolitan Dist. Water Supply Comm., R. N. Molt, secy., K. R. Kennison, ch. engr., 20 Somerset St., Contr. 107, 1 story, bsmnt., 26x54 ft. and 20x48 ft., concrete, stone buildings, appurtenances, at Ware, in connection with Quabbin Reservoir Project, to H. P. Cummings Constr. Co., 14 Prospect St., Ware. **$72,086.** Bids 11/7. CD 10/29—ENR 10/31.

Miss., Meridian—J. W. Goodwin, city comr., watermain exten. **WPA. $82,999.**

†N. J., Fort Dix—Con. Q.M., Governors Island, N. Y., 5,500 ft. 8 in., c.i. watermains and connections to various mains. WPA. **$32,110.** CD 11/6—ENR 11/14.

†N. J., Fort Hancock—Quartermaster General, Wash., D. C., water and sewerage sys. addn. and pumphouse at Fort Hancock, to Spiniello Constr. Co., 437 Riverside Ave., Newark. **$70,881.**

N. Y., Minerva—Installing c.i. mains, developing springs, placing valves, etc. **WPA. $35,000.** C. L. Post, Old P. O. Bldg., Albany, ch. engr. WPA projects.

Pa., Altoona—Additional watershed and water supply sys. imprvs. **WPA. $393,752.** B. V. Schwab, City Hall, engr.

Pa., Erie—City, Bureau Water. J. Dunwoody, supt., City Hall, watermain renewals, extens., service connections, etc., various parts city, own forces. **$175,000.** A. N. Aitkin, city engr. CD 11/18—ENR 11/21.

†Tex., El Paso—Con. Q.M., Fort Bliss, water storage steel tank and 75 ft. tower, to Chicago Bridge & Iron Co., 37 W. Van Buren St., Chicago, Ill., about **$42,000.** Est. $48,000. Bids 11/7, awarded 11/15. CD 11/1.

†Tex., Fort Biggs—Con. Q.M., Fort Biggs, and Wash., D. C., 150,000 gal. steel water storage tank and 75 ft. steel tower, to Chicago Bridge & Iron Co., 37 W. Van Buren St., Chicago, Ill., about **$18,290.** Est. $30,000. Awarded 11/15.

Utah, Price—10 mi. water supply line, **WPA. $127,854.** C. Nyman, Price, engr.

†Utah, Salt Lake City—Con. Q.M., Hill Field, Ogden, elevated steel tank at airport, to Pittsburgh-Des Moines Steel Co., 1015 Tuttle St., Des Moines, Ia. **$21,945.**

Wis., Browntown—WW sys., **WPA. $38,700.**

SEWERS, WASTE DISPOSAL

PROPOSED WORK

Fla., Port St. Joe — Drainage structures throughout city. Over $25,000.

Fla., Winter Haven—Sanitary Sewage disposal plant and lift stations. $330,000.

Ill., Lemont—E. Ott, village clk., sewage treatment and water treatment plants, $200,000. Applied for WPA funds. Marr, Green & Opper, 400 N. Michigan Ave., Chicago, engrs.

Ill., Rockford—Rockford Sanitary Dist., H. A. Riedesel, supt. sewage treatment plant addn. $80,000. Seeking WPA funds. Greeley & Hansen, 6 N. Michigan Ave., Chicago, engrs.

Kan., Kansas City—H. Payne, city clk., 8- to 24-in. storm sewer, taking in Kansas and Berger Storm Sewer Dist. Sub-sewer Dist. 13 and 36 and Freeman Ave. Sewer Dist. $30,000.

La., Bunkie—Sewer project. $25,000. M. M. Merrick, Marksville, engr.

Minn., Breckenridge—Voted $75,000 bonds, sewage disposal plant. Over $100,000. WPA. CD 11/13.

Mo., Piedmont—Sanitary sewers, sewage disposal plant. $29,800. S. Deneke, Fredericktown, engr.

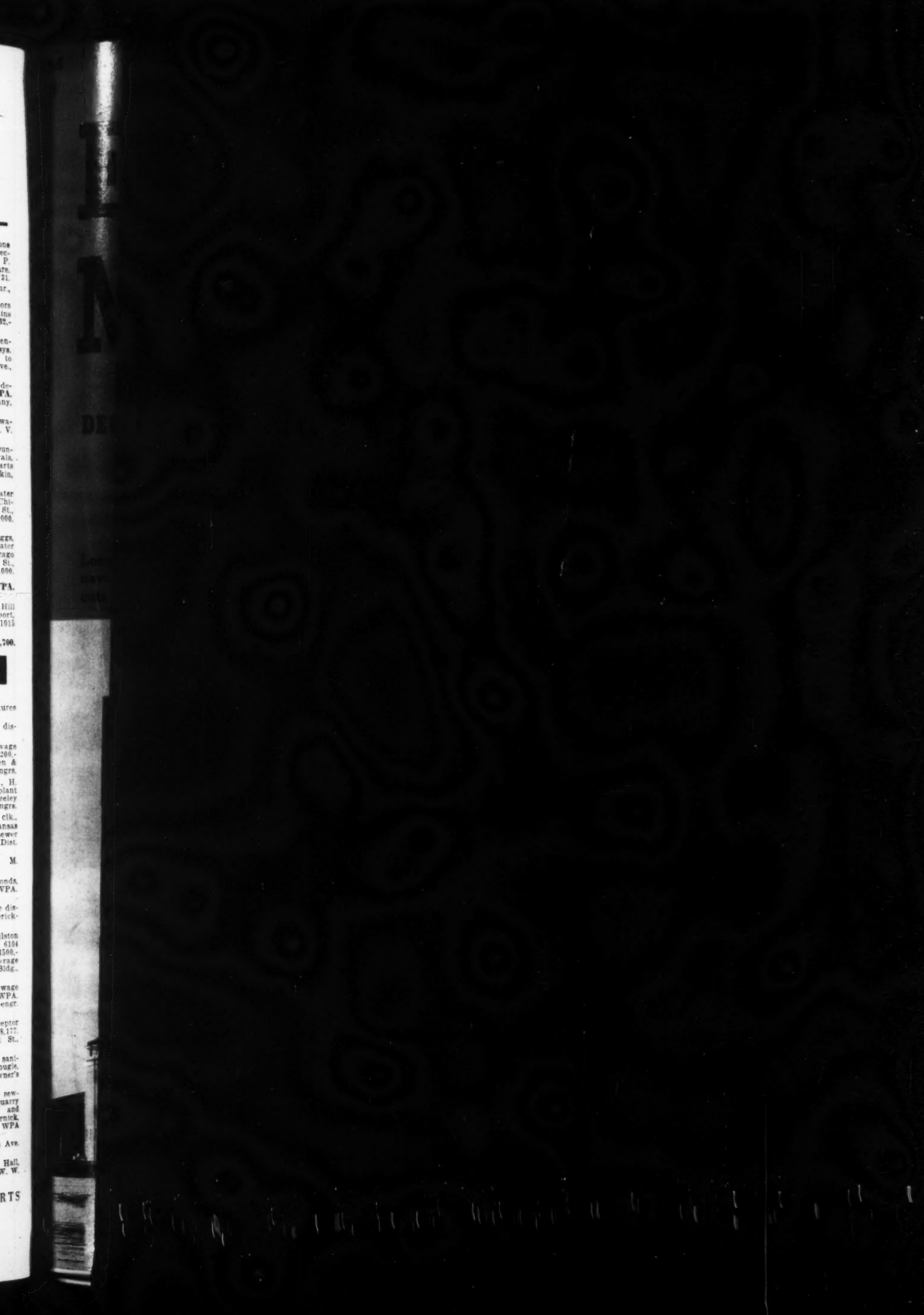
★**Mo., Wellston (St. Louis P. O.)**—Wellston Sewer Dist., F. A. Grossman, atty., 6104 Easton Ave., Wellston (St. Louis P. O.), $500,000 bond election Dec. 3, sanitary sewerage sys. H. Shifrin, International Office Bldg., St. Louis, engr.

Neb., Kearney—I. Mattson, mayor, sewage disposal plant. $220,000. Will apply to WPA. D. McKnight, 1819 S. 23 St., Lincoln, engr. CD 11/7—ENR 11/14.

N. J., Long Branch—Branchport Intercepter sanitary sewer, vitr. tile pipe, etc. $168,177. WPA. W. D. Cougle, 1102 S. Broad St., Trenton, WPA and owner's engr.

N. J., Long Branch—Exten. vitr. tile sanitary sewers. $52,448. WPA. W. D. Cougle, 1102 S. Broad St., Trenton, WPA and owner's engr.

N. J., West Orange—Vitr. tile sanitary sewers, manholes, etc. in Grand Blvd., Quarry Terrace, Edgewood Ave., Valley View and Wakeman Sts. $59,191. WPA. H. Warnick Town Hall, West Orange, town and WPA engr.

N. Y., Auburn—Sanitary sewers, Alden Ave. and Genesee St. Over $25,000.

N. Y., Brooklyn—Boro Pres., Boro Hall, sewers at 2 locations. $110,957. WPA. W. W.